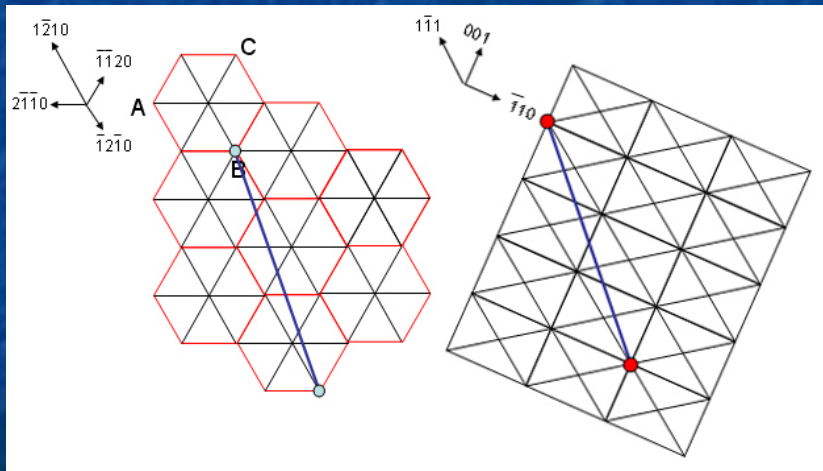


Determination of Activation Energies and Modeling of Low Temperature Creep of Alpha, Alpha-Beta, and Beta Titanium Alloys

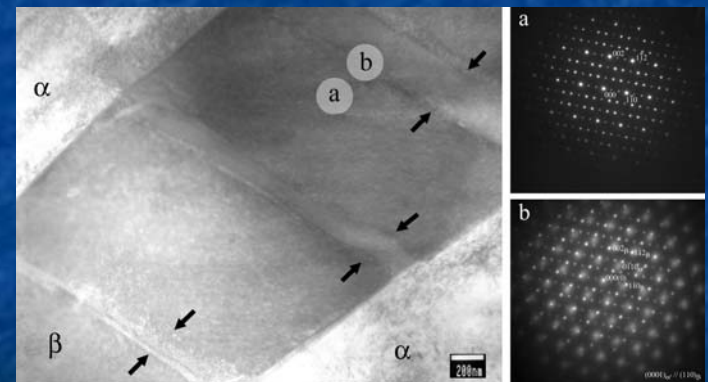
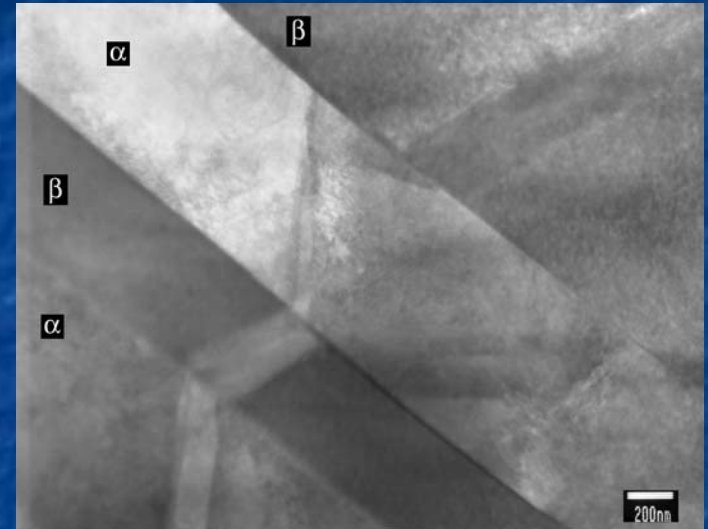
R. Briber & S. Ankem, FASM, University of Maryland, College Park, DMR# 0102320,

Intellectual Merit

- Titanium alloys are used in a wide range of ever increasing applications.
- Room temperature creep is an important factor in many applications.
- This concern must be addressed in order to design new, high performance, titanium alloys.



The interaction effects between the α and β phases in two-phase titanium alloys can result in deformation mechanisms that differ from the individual phases.



TEM analysis of the tensile deformation mechanisms of α - β Ti-8.1V alloy shows that the deformation mechanisms are twinning in α in conjunction with stress induced martensite in β , a combination seen for the first time.

Determination of Activation Energies and Modeling of Low Temperature Creep of Alpha, Alpha-Beta, and Beta Titanium Alloys

R. Briber & S. Ankem, FASM, University of Maryland, College Park, DMR# 0102320

BROADER IMPACT

Education

Several students have completed studies or are currently involved with research under this grant. The students are working with α , β , and α - β titanium alloys. Experimental methods include mechanical testing and transmission electron microscopy. Candi Hudson has received a PhD, and is currently employed at Johns Hopkins Applied Physics Lab. Allan Jaworski has received his masters degree and will complete a PhD. Greg Oberson is working towards a PhD.

Outreach

- Dr. Ankem is also the faculty advisor for the TMS/ASM student chapter which is involved with recruiting new students and educating new students about the materials science field.
- The paper "The Effects of Stress Level and Grain Size on the Ambient Temperature Creep Deformation Behavior of an Alpha Ti-1.6V Alloy" has been accepted for publication in Metallurgical & Materials Transactions A.
- The paper "Recent developments in Ambient Temperature Creep Deformation Behavior of Titanium Alloys" was published in the conference proceedings of the Third International Conference on Light Materials for Transportation Systems, Honolulu, Hawaii, November 2003.